

REMARKS

An excess claim fee payment letter is submitted herewith for one (1) additional independent claim.

Claims 1, 3-6, 9-15, 17, 19, and 21-24 are all the claims presently pending in the application. Claims 1, 10 - 15, and 21 are amended to more clearly define the invention and claims 22-24 are added. Claims 1, 15, 17, 19, 21, and 24 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Applicant also notes that, notwithstanding any claim amendments herein or later during prosecution, Applicant's intent is to encompass equivalents of all claim elements.

Applicant gratefully acknowledges that claims 9-10 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Applicant respectfully submits that all of the claims are allowable.

Claims 1, 3-6, 15, 17, 19, and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Shimojo et al. reference in view of the DeNap et al. reference.

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined, for example, by independent claim 1, is directed to a connection apparatus for a public network switching system, the switching system having a first plurality of line ports to which a plurality of user terminals are connected, a second plurality of line ports, a first plurality of trunk ports to which a plurality of Internet lines are connected, and a second plurality of trunk ports. The

apparatus includes a switching unit having a plurality of diverging ports adapted for connection to said second plurality of trunk ports and a plurality of converging ports adapted for connection to the second plurality of line ports, and a control unit responsive to a request signal from one of the user terminals for establishing in the switching unit at least one connection specified by said request signal between one of the diverging ports and at least one of the converging ports. The public network switching system establishes a connection between the one diverging port and the one user terminal and at least one connection between the second plurality of line ports and the first plurality of trunk ports corresponding in number to the at least one connection established in the switching unit.

Conventional dial-up IP services allow subscribers to establish dial-up connections to Internet service providers through a public switched telephone network. The switching systems in these public switched telephone networks connect these subscribers to the Internet service providers in a one-to-one correspondence, thereby requiring that the Internet service providers install equipment in the public switched telephone network that can communicate to the modems of the subscribers with perfect compatibility.

Additionally, as the numbers of communications protocols and transmission speeds increase, the lines that are leased to the Internet service providers must be grouped according to these protocols and transmission speeds using phone numbers to maintain compatibility.

Moreover, with a large number (M) of user terminals requesting simultaneous identical branch connections for a large number (N) of Internet service providers a very large number (M x N) of branch connection paths is required.

Thus, these conventional dial-up IP services suffer the high cost of installed equipment and numbers of leased lines that cannot efficiently provide the service.

In stark contrast, the present invention provides a switching unit that connects to the switching system of the public switched telephone unit. The switching unit of the present invention is capable of significantly reducing the number of branch connections that are required to be established in the switching system of the public switched telephone network. For example, when a large number (M) of user terminals requesting simultaneous identical branch connections for a large number (N) of Internet service providers, (M x N) paths are established, in the switching unit of the present invention only (M + N) paths need to be established in the switching system of the public switched telephone network. In this manner, the present invention can greatly relieve the burden of the switching system of the public switched telephone network.

Further, an exemplary embodiment of the present invention may further include multiplexers. In this manner, since the lines between the switching system of the public switched telephone network and the Internet service providers are always lightly loaded with traffic, the access line of each Internet service provider may support multiplexed traffic for a number of user terminals.

Additionally, due to the significant increase in the utilization efficiency of these access lines, the Internet service providers are relieved of the burden of paying high access charges for providing flat rate services to Internet subscribers.

II. THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION

The Examiner alleges that claims 11-14 are indefinite. While Applicant submits that such would be clear to one of ordinary skill in the art taking the present Application as a whole, to speed prosecution claims 11-14 have been amended in accordance with Examiner Kading's very helpful suggestions.

In view of the foregoing, the Examiner is respectfully requested to withdraw this rejection.

III. THE PRIOR ART REJECTION

The Examiner alleges that the DeNap et al. reference would have been combined with the Shimojo et al. reference to form the claimed invention. Applicant submits, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Shimojo et al. reference is directed to preventing the loss of cells due to congestion in an ATM exchange network by providing a flow control method/apparatus for ATM switch nodes that do not have a flow control function (col. 1, line 1 - col. 4, line 33).

In stark contrast, the DeNap et al. reference is specifically directed to the problem of deploying ATM networks for markets that have different and various service requirements (col. 1, lines 25-63) by providing a incremental migration of ATM service offerings (col. 1, line 66 - col. 2, line 2).

One of ordinary skill in the art who was concerned with preventing the loss of cells due to congestion in an ATM network as the Shimojo et al. reference is concerned with addressing would not have referred to the DeNap et al. reference because the DeNap et al. reference is directed to the completely different and unrelated problem of deploying ATM networks for markets that have different and various service requirements. Thus, the references would not have been combined, absent hindsight.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

None of the applied references teaches or suggests the features of the present invention including: 1) a switching unit having a plurality of diverging ports (independent claims 1, 15, 17, 19, and 21); 2) a public network switching system that establishes a connection between the diverging port and the user terminal (independent claims 1, 15, 17, 19, and 21); 3) a public network switching system that establishes a connection between the second plurality of line ports and the first plurality of trunk ports (independent claims 1, 15, 17, 19, and 21); and 4) the number of the connections between the second plurality of line ports and the first plurality of trunk ports in the public network switching system corresponding to the number of connections established in the switching unit (dependent claims 22-23). As explained above, these features are important since the lines between the switching system of the public switched telephone network and the Internet service providers are always lightly loaded with traffic, the access line of each Internet service provider through the public switched telephone network may support multiplexed traffic for a number of user terminals.

Firstly, contrary to the Examiner's allegations, the Shimojo et al. reference does not teach or suggest a switching unit having a plurality of diverging ports. This feature is important for the present invention because a request from a user terminal may specify a connection to each of a number (N) of Internet service providers and a connection from each of the first plurality of line ports into the switch must diverge into N separate trunk ports in order for the user terminal to communicate with each of the N Internet service providers.

In stark contrast, the Shimojo et al. reference only discloses a switch node that may

converge signals from multiple input ports into a single output port (see, for example, Fig. 14 and column 11, lines 59-64).

The Examiner cites Figure 13 and elements 96 in an attempt to support the allegation that the Shimojo et al. reference discloses a switching unit having a plurality of diverging ports. However, contrary to the Examiner's allegation, the input switch 96 merely switches incoming data to only one of the interior of a corresponding flow control element 94 or a different flow control element 94. (Col. 11, lines 31 - 40). In other words, the input switch 94 of the Shimojo et al. reference does not diverge the input port to multiple output ports as recited by the present invention. Rather, the Shimojo et al. reference merely discloses selecting between individual outputs.

Further, contrary to the Examiner's allegation the switch node 92 is not a public network switching system. Rather, the switch node 92 forms a part of an ATM network (col. 6, lines 4-7).

Indeed, the Shimojo et al. reference does not have anything at all to do with a public network switching system, let alone a public network switching system that establishes a connection between a diverging port and a user terminal and that establishes a connection between a second plurality of line ports and a first plurality of trunk ports.

The DeNap et al. reference does not remedy these deficiencies.

The Examiner admits that the Shimojo et al. reference does not teach or suggest Internet lines. The Examiner cites the DeNap et al. reference in an attempt to remedy this deficiency.

The Examiner cites element 160 in Figure one of the Shimojo et al. reference as disclosing a connection to the Internet.

However, the claims do not merely recite "Internet lines." Rather, the claims recite a

public network switching system that includes a first plurality of trunk ports to which a plurality of Internet lines are connected.

In stark contrast, as shown in Figure 1, the DeNap et al. reference discloses an ATM network 100 in communication with a public switched telephone network 150 and the Internet 160. The ATM network 100 is provided to connect businesses 101, 102, 103, and 104 with each other and with the public switched telephone network 150, the Internet 160 and the frame relay network 170 (col. 4, lines 61-66). In other words, the public switched telephone network 150 is not in communication with the Internet 160. Rather, only one of the businesses 101 - 104 is in communication with the Internet 160 through the ATM network 100.

In this manner, the DeNap et al. reference discloses providing a user (the businesses 101 - 104) with access to any one of the public switched telephone network 150, the Internet 160 and the frame relay 170 through the use of the ATM network 100.

This is in stark contrast with the present invention which provides access to the Internet for a user through a public network switching system without requiring passing through an ATM network.

Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 1, 3-6, 15, 17, 19, and 21.

IV. FORMAL MATTERS AND CONCLUSION

The Office Action objects to claims 1, 13, 15, and 21. This Amendment amends claims 1, 13, 15, and 21 in accordance with Examiner Kading's very helpful suggestions. Applicant respectfully requests withdrawal of these objections.

In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1, 3-6, 9-15, 17, 19, and 21-24, all the claims presently pending in the

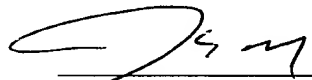
Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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